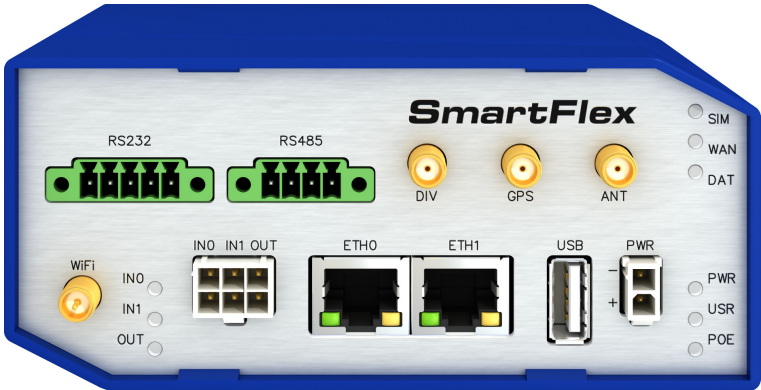
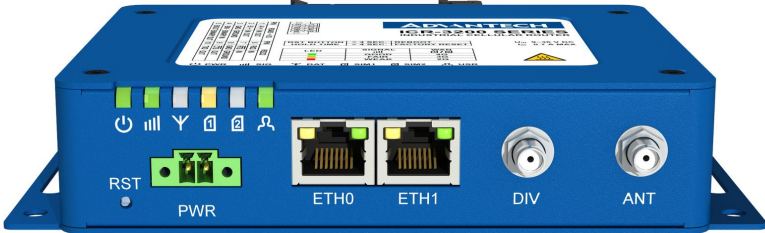




# Firmware 6.2.0

## RELEASE NOTES



# Abstract

This document describes:

- Firmware update instructions.
- Description of all new features, fixes and other changes implemented in the firmware.
- Known issues related to a firmware version.

# Firmware Details

- **Firmware version:** 6.2.0
- **Release date:** August 16, 2019
- **Hardware compatibility:** This firmware is applicable to the routers made by Advantech company.

Please note that not all new Advantech routers are produced and shipped with the latest release of the firmware. The reason for this is usually an existing certification valid for a specific carrier or a region. For more information about the latest version of the firmware for your router, see the *Firmware Distribution Overview* document.



For current and detailed information about the router configuration see the latest version of the *Configuration Manual* for your router.

Product related documents and applications including the firmware can be obtained on *Engineering Portal* at <https://ep.advantech-bb.cz/> address.

# **Part I**

# **Firmware Update Instructions**

## General Update Instructions and Notices

**HTTPS certificates:** The HTTPS certificate format in the router was updated in FW 5.3.5 to improve the security. Existing HTTPS certificates on previously manufactured routers will not automatically be updated with the firmware update! It is possible to update the HTTPS certificates by deleting the files within `/etc/certs/https*` in the router (e.g. via SSH). The certificates will be re-created automatically during the router's next start.

## Specific Update Instructions

**New filename:** If the filename of firmware for your router was changed, you will meet with an issue during manual firmware updating or with automatic firmware update feature. This warning message will appear during the firmware updating process: *"You are trying to upload file "xx.bin" but "yy.bin" is expected. Are you sure to continue?"*

To proceed with the firmware updating please follow these steps: Check the table below for details about recent firmware filename changes and make sure you have the correct firmware file for your router. Go ahead with manual firmware updating and confirm the displayed warning message.

To proceed with automatic firmware updating, rename new firmware files (\*.bin and \*.ver) to filenames valid before the filename change. This should allow the router to pass through the process of automatic firmware updating. Next time, the automatic firmware update feature will work as expected with no need to rename the file.

Router model	FW ver.	New filename	Original filename
SmartMotion ST352 SmartMotion ST355	6.0.2	SPECTRE-v3T-LTE.bin	BIVIAS-v3LL.bin
SmartStart SL302	6.0.3	SPECTRE-v3L-LTE-US.bin	SPECTRE-v3L-LTE-AT.bin

Table 1: Recent firmware filename changes

## Updating Firmware of Version Less than 5.3.0



It is necessary to follow specific update instructions below only if you are updating from firmware older than 5.3.0.

**Due to a bug in the firewall (now fixed) when a WAN device is part of a bridged interface, caution should be taken when updating in following case:**

**Condition:** When a WAN device is part of a bridged interface, access to that WAN device (HTTPS, SSH) is always granted regardless of configuration.

**Problem:** If this is your configuration, it is highly likely that you are not aware of this, so the undesired effect of the bridge firewall fix may render the router inaccessible.

**Recommended Action:** Enable access to both the web and ssh services before updating if you want to retain the current behavior (access to the WAN interface). This can be done on the *NAT* page in the *Configuration* section of the router's Web interface.

### Change the root's password:

It is necessary to change the password for the *root* user when updating to the firmware of version 5.3.0 or newer. The reason for this is an update of the authentication system (encryption algorithm *crypt* was changed to *MD5*; passwords are now stored in the */etc/shadow* file instead of */etc/passwd*). The change of the password is required before setting up the remote access on the *NAT Configuration* page.

Please note that when downgrading from 5.3.0+ to previous firmware versions, the password for the *root* user is reset to the default one, which is *root*.

**Part II**  
**Changelog**



**Legend:** Affected products are marked as shown below for every changelog item:

Affected product    Not affected product

## WiFi Module Support

ER75i    SPECTRE 3G    SPECTRE RT    SPECTRE LTE-AT    SPECTRE LTE-VZ  
 ER75i v2    UR5i v2    XR5i v2    LR77 v2    CR10 v2    UR5i v2L    RR75i v2    LR77 v2L    XR5i v2E  
 Bivias v2HC    Bivias v2LC    Bivias v2LL    Bivias v2LH    Bivias v2HH  
 SmartFlex SR300    SmartFlex SR303    SmartFlex SR304    SmartFlex SR305    SmartFlex SR306    SmartFlex SR307  
 SmartFlex SR308    SmartFlex SR309    SmartStart SL302    SmartStart SL304    SmartStart SL306  
 SmartMotion ST352    SmartMotion ST355    **ICR-321x**    **ICR-323x**    **ICR-324x**    ICR-383x

Support for *Laird SU60* WiFi module was added to this firmware release.



Firmware of version 6.2.0 is the first version of firmware that supports the WiFi module for the affected products.



Current firmware for the WiFi module does not support the setting of the country code. Due to this issue, the settings of the country code made on the configuration page has no effect at all. The country code is set up during the manufacturing process according to the product destination region.

## WiFi *Multi-role* Mode

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

A new role called *multi-role* is now utilized for the WiFi module. This role allows the WiFi module to operate as access point (AP) and station (STA) simultaneously.



ICR-3200 products do not support the multichannel mode, so the AP and STA must operate on the same channel only.



Configuration for the WiFi and WLAN in the GUI was redesigned completely. For detailed information, see the configuration manual of your router.



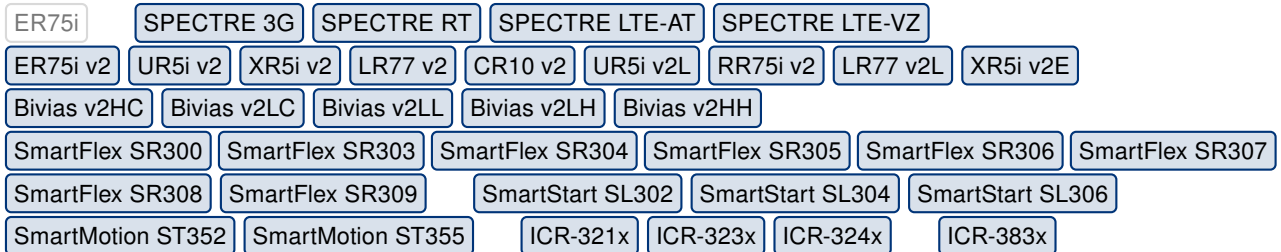
If the firmware is downgraded to the version less than 6.2.0, the WiFi configuration will be lost completely.



The GUI for products not affected by this change was redesigned as well. But these products do not support the *multi-role* mode.

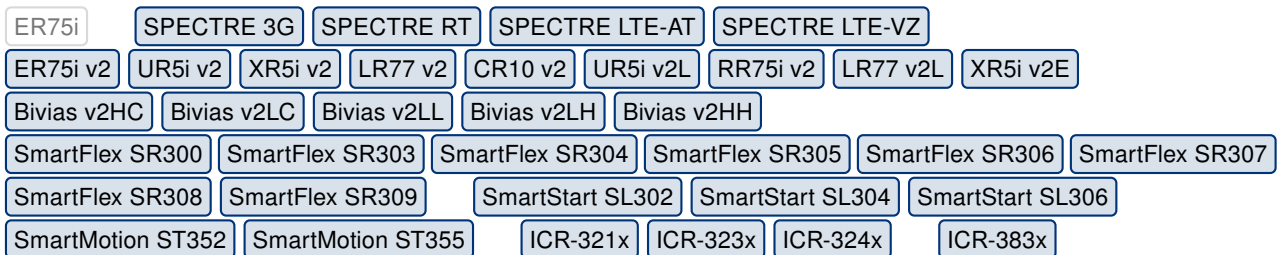


## Load Balancing



One of the most significant updates in this firmware release is the new feature of data load balancing. This feature can be used to improve the distribution of workloads across multiple interfaces. It can be configured on *Backup Routes* configuration page by enabling backup routes switching and selecting the mode to the *Load Balancing*. Next, you can set interface parameters to control the load balancing as required. For detailed information, see the configuration manual of your router.

## PPPoE Configuration Enhancement



The Ethernet interface, which will be used for the PPPoE connection, can now be selected during the PPPoE configuration. VLAN tagging for the PPPoE connection is now supported and can be configured as well.

## PAM RADIUS Authentication

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

Added support for PAM (Pluggable Authentication Module) RADIUS authentication method for different types of access to the router. For detailed information, see the configuration manual of your router.

## Hardware Flow Control

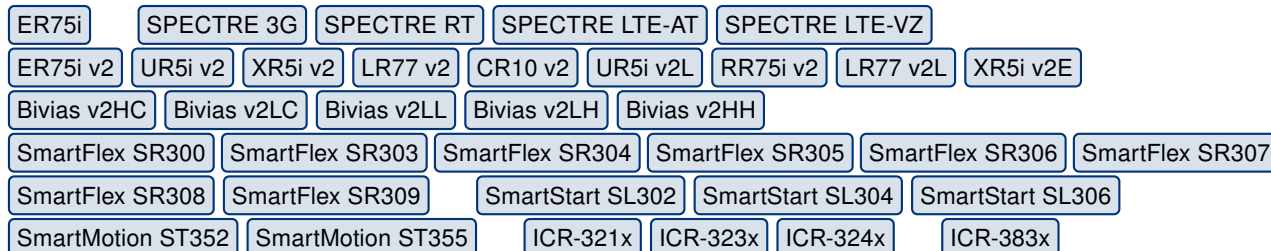
ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

Until now, the flow control of communication on a serial interface was not supported. New item *Flow Control* was added to the GUI to set up the control either to the *hardware* or to the *none* mode.



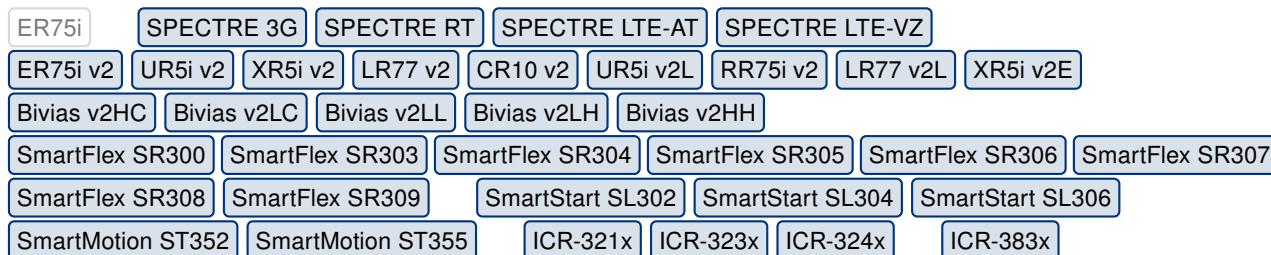
Routers of some production lines may not support the setting of the flow control for the CPU serial line. In this case, the flow control is set to *none* and cannot be changed to the *hardware* mode.

## Certificate Uploading



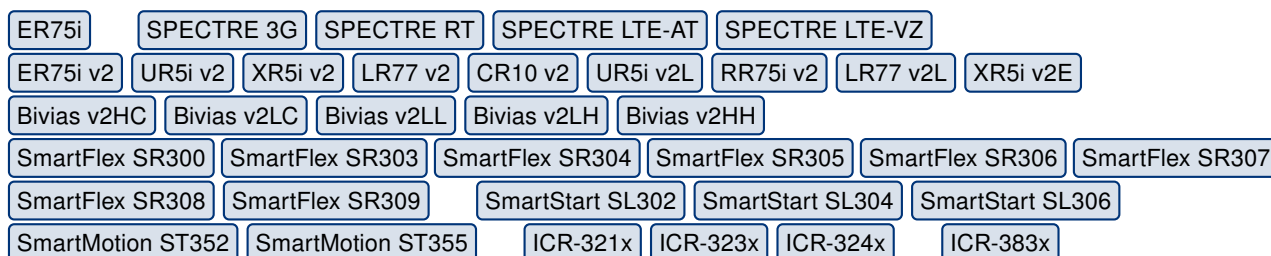
Certificates having the *PEM* or *PKCS#12* format can now be directly uploaded via the GUI. All certification entries in the GUI have a new button to browse and load a certificate stored in a file. This file is then processed and the required information is loaded to the configuration page automatically.

## VRRP Enhancements



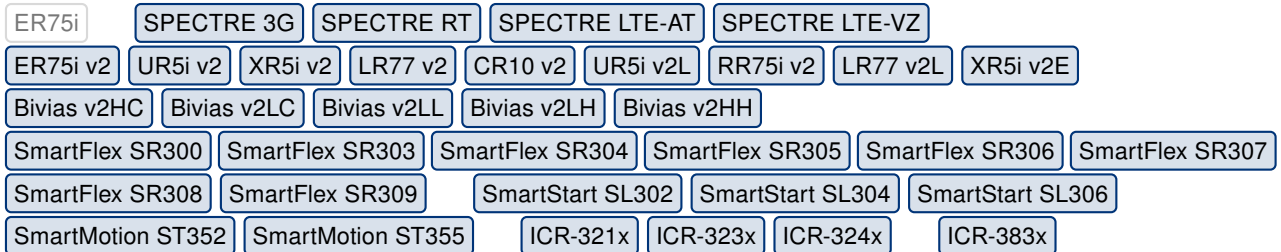
*VRRP* (Virtual Router Redundancy Protocol) was enhanced with the support of *VRRP* ver. 3. Besides, the second instance of *VRRP* can be configured and active simultaneously with the first one. This can be useful in case the connection check for both IPv4 and IPv6 is required.

## Updated Design of the Web Interface



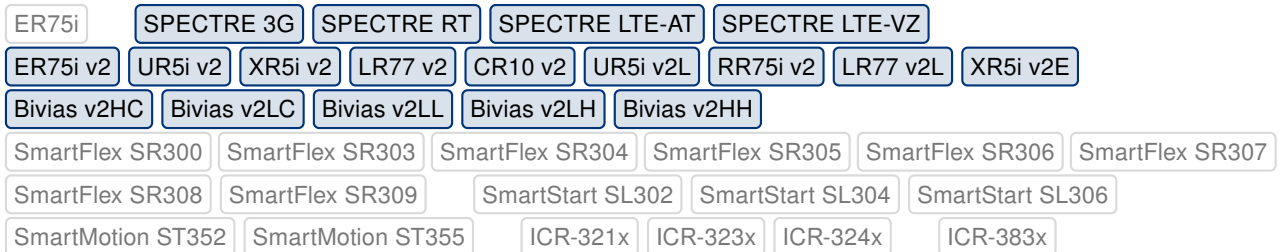
The design of the web interface was slightly updated. A company logo was added to the left upper corner. Besides, the theme color and text margins were updated.

## Toolchain Hardening



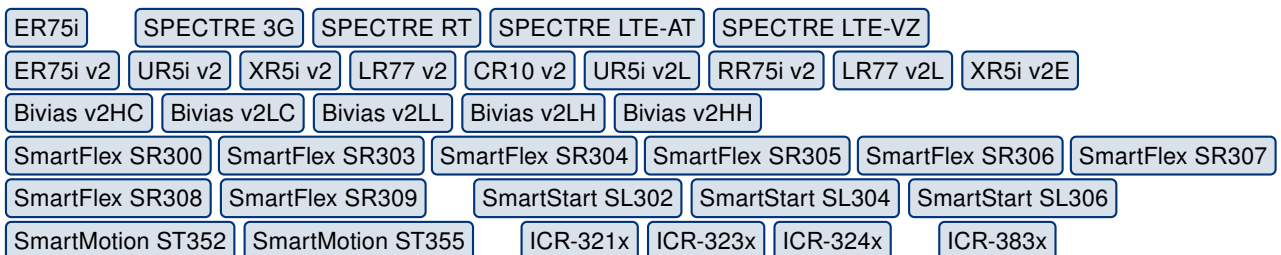
Programs used in the firmware were built using techniques for securing them against some possible security attacks.

## Disabled Insecure Services



Due to the security reasons, the *FTP* and *Telnet* services are now disabled by default.

## Fixed Netmask Validation



Fixed JavaScript for validation of network mask format entered in the web GUI. The issue was that an empty string could be passed to this field.

## Kernel Upgrade

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

The kernel was upgraded to version 4.14.138.

## Updated *glibc* Library

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*Glibc* library was updated from version 2.25 to version 2.30. For more details about the release, see [this link](#).

This update has fixed [CVE-2017-12132](#), [CVE-2017-1000366](#), [CVE-2010-3192](#), [CVE-2017-12133](#), [CVE-2009-5064](#), [CVE-2017-15670](#), [CVE-2017-15671](#), [CVE-2017-15804](#), [CVE-2017-17426](#), [CVE-2017-1000408](#), [CVE-2017-1000409](#), [CVE-2017-16997](#), [CVE-2018-1000001](#), [CVE-2018-6485](#), [CVE-2016-6261](#), [CVE-2016-6263](#), [CVE-2017-14062](#), [CVE-2017-18269](#), [CVE-2018-11236](#), [CVE-2018-11237](#), [CVE-2018-19591](#), [CVE-2019-6488](#), [CVE-2016-10739](#), [CVE-2019-7309](#) and [CVE-2019-9169](#).

## Updated *OpenVPN* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*OpenVPN* program was updated to version 2.4.7. For more details about the release, see [this link](#).

### Updated *curl* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*Curl* program was updated to version 7.65.3. For more details about the release, see [this link](#).

### Updated *sudo* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*Sudo* program was updated to version 1.8.22. For more details about the release, see [this link](#).

### Updated *iptables* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*Iptables* program was updated to version 1.4.21. For more details about the release, see [this link](#).

### Updated *iproute2* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*iproute2* program was updated to version 4.14.1. For more details about the release, see [this link](#).

### Updated *iw* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*iw* program was updated to version 4.14. For more details about the release, see [this link](#).

### Updated *hostapd* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*Hostapd* program was updated to version 2.9. For more details about the release, see [this link](#).

## Updated *wpa\_supplicant* Program

ER75i	SPECTRE 3G	SPECTRE RT	SPECTRE LTE-AT	SPECTRE LTE-VZ				
ER75i v2	UR5i v2	XR5i v2	LR77 v2	CR10 v2	UR5i v2L	RR75i v2	LR77 v2L	XR5i v2E
Bivias v2HC	Bivias v2LC	Bivias v2LL	Bivias v2LH	Bivias v2HH				
SmartFlex SR300	SmartFlex SR303	SmartFlex SR304	SmartFlex SR305	SmartFlex SR306	SmartFlex SR307			
SmartFlex SR308	SmartFlex SR309	SmartStart SL302	SmartStart SL304	SmartStart SL306				
SmartMotion ST352	SmartMotion ST355	ICR-321x	ICR-323x	ICR-324x	ICR-383x			

*Wpa\_supplicant* program was updated to version 2.9. For more details about the release, see [this link](#).



## **Part III**

# **Known Issues**

## Firmware Update – Unexpected Filename

If the filename of firmware for your router was changed, you could have an issue during manual firmware updating or with Automatic Update feature. This warning message will appear: "You are trying to upload file "xx.bin" but "yy.bin" is expected. Are you sure to continue?" To fix this issue follow instructions in Part I - [Firmware Update Instructions](#).

## Automatic Update – Update to Version 6.1.10

The feature of automatic firmware update will not recognize the firmware of version 6.1.10 as a new version in case the installed version of firmware is from 6.1.0 to 6.1.8. To fix this issue, either update the firmware by the automatic update to version 6.1.9 first or update it manually directly to the version 6.1.10.



## WiFi Configuration – Lost After Firmware Downgrade

If the firmware is downgraded to the version less than 6.2.0, the WiFi configuration will be lost completely.



## ICR-3200 – Country Code for WiFi

The first version of the firmware for the WiFi module does not support the settings of the country code. Due to this issue, the settings of the country code made on the configuration page has no effect at all. The country code is set up during the manufacturing process according to the product destination region.

## SmartStart – Cellular Network Registration

It is necessary to use router's firmware of version 6.1.5 or higher if the *Telit* cellular module installed in your SmartStart router has following version of the firmware:

- *Telit LE910-EU V2* cellular module with firmware version 20.00.403 or newer,
- *Telit LE910-NA1* cellular module with firmware version 20.00.014 or newer.

Note: The model name and firmware version of the cellular module can be found on router's web GUI at *Mobile WAN Status* page in *Mobile Network Information* section.

## SmartStart SL302 – Cellular Network Authentication

It is not possible to use username and password when connecting to Mobile WAN network (on *Mobile WAN Configuration* page) if your SmartStart SL302 router has the 20.00.522 firmware version inside the Telit LE910-NA1 cellular module. The version of cellular module firmware can be found at *Mobile WAN Status* page in *Mobile Network Information* section.

## SmartStart SL302 – SMS in Verizon Network

SmartStart SL302 router (equipped with the *Telit* modules *LE910-SV1* or *LE910-NA1*) supports sending and receiving of SMS in *Verizon* cellular network since the firmware version 6.1.4. Please note that to support SMS receiving, cellular module with Verizon firmware of version higher than 20.00.012 is required.